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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/568,190	05/17/2006	Hans Braun	8009-88059	8141

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EXAMINER	
COX, ALEXIS K	
ART UNIT	PAPER NUMBER
3744	
MAIL DATE	DELIVERY MODE
07/01/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/568,190	BRAUN ET AL.	
	Examiner	Art Unit	
	ALEXIS K. COX	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 April 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: on page 2 of the specification, reference is made to claim 1. This is not in accordance with standard US Practice.

Appropriate correction is required.

Claim Objections

2. Claims 1-8 are objected to because of the following informalities: claim 1, line 7, refers to "the valves." As the only previous recitation refers to "a valve," correction to "the valve" is required. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-3, 6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Corriveau (US Patent No. 6,178,928) in view of Goubeaux et al (US Patent No. 5,022,234).

Regarding claim 1, Corriveau discloses an internal combustion engine total cooling control system comprising an engine (14, see column 2 line 65), a temperature sensor (54, see column 4 line 14) with associated valves (26, see column 3 line 12) which with the controller (36, see column 3 lines 36-38) constitutes a thermostat, a small coolant circuit without a radiator (14, 12, 20, 26, 24, 22, 28, see figure 1) and a large coolant circuit with a radiator (14, 12, 20, 26, 24, 16, 22, 28, see figure 1) which can be separated from one another or mixed with one another in a temperature controlled manner, or connected to one another in a mixing mode with a mixing ratio with closed-loop control of the temperature, and the operating units of the valves in the thermostat are triggered by a control means (36, see column 3 lines 36-38) in response to input control

parameters, the input control parameters including the prespecification of desired coolant temperatures, and one of a plurality of possible prespecified desired coolant temperatures (see column 6 lines 52-56) is set by opening and closing the valves in the thermostat (see column 6 lines 57-61). It is noted that the coolant temperature setting is not characterized in that the closed-loop control to each prespecified desired coolant temperature involves a first and second closed-loop control phase with the first closed-loop control phase in the form of basic adaptation with stored control parameters setting the currently prespecified desired coolant temperature as quickly as possible, and, after the respectively current desired coolant temperature is reaches, the second closed-loop control phase in the form of fine adaptation with variable control parameters keeping the currently prespecified desired coolant temperature as constant as possible. Goubeaux et al discloses a control method for a variable displacement air conditioning system compressor comprising multi-phased closed loop control (see column 3 lines 24-33 and figure 1; see page 13 of Control Systems Engineering, fourth edition, by Norman S. Nise, for further evidence and clarification of the definition of a closed loop) with a first basic adaptation (COARSE CONTROL with stored control parameters (pressure error changeover value, see column 4, lines 21-24) setting the currently prespecified desired coolant parameter as quickly as possible (see column 4 lines 21-25) and, after the respective current desired coolant parameter is reached, the second closed-loop control phase (FINE CONTROL) in the form of fine adaptation with variable control parameters keeping the current prespecified desired coolant parameter

as constant as possible (see column 4 lines 27-42 and column 2 lines 34-43). Further, although the system of Goubeaux et al uses pressure as the controlled parameter, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the algorithm of Goubeaux et al in the system of Corriveau in order to obtain rapid temperature control of the engine coolant fluid without sacrificing efficiency.

Regarding claims 2 and 3, it is noted that Corriveau does not disclose the method required. However, the method of Goubeaux et al discloses the new parameter to be set by fine adaptation when the currently prespecified desired coolant parameter is changed (see column 6 lines 52-53 and 66-67), and the basic adaptation setting are improved by the corrected fine adaptation settings (see column 2 lines 48-51). Further, although the system of Goubeaux et al uses pressure as the controlled parameter, pressure control inherently includes temperature control as is shown below in the response to arguments, and it would have been obvious to one of ordinary skill in the art at the time of the invention to use the algorithm of Goubeaux et al in the system of Corriveau in order to obtain rapid temperature control of the engine coolant fluid without sacrificing efficiency, much like Goubeaux et al uses the algorithm to obtain rapid pressure control.

Regarding claim 6, it is noted that Corriveau does not disclose the method required. However, the current desired coolant temperature is selected from at least three different prespecified desired coolant temperatures as a function of the load (see column 3 lines 42-51).

Regarding claim 8, it is noted that Corriveau does not disclose the method required. However, it is explicitly stated in Corriveau that to a first order of magnitude approximation, the mass flow rate of the coolant through the radiator controls the total amount of heat which can be rejected (see column 5 lines 57-62), which will determine the equilibrium system temperature. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a proportional control of mass flow rate through the radiator relative to temperature of the engine coolant as a simple and effective backup in the event of the failure of the more complicated system previously disclosed, especially as the simple substitution of an electronically controllable thermostatic valve for the one disclosed would have the desired effect of maintaining some engine temperature control in the event of failure of the controller.

7. Claims 4, 5, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Corriveau (US Patent No. 6,178,928) in view of Goubeaux et al (US Patent No. 5,022,234), further in view of Dao (US Patent No. 6,304,803).

Regarding claims 4, 5, and 7, it is noted that Corriveau in view of Goubeaux et al does not explicitly state the basic coolant temperature setting to be matched to the ambient temperature when the motor vehicle is started. Dao discloses an ambient temperature sensor and display (108, 112, see column 4 lines 46 and 60-64), and the simple substitution of the control panel of Dao for that of Corriveau in view of Goubeaux and the addition of an external temperature sensor to provide information to those inside the vehicle would have been obvious to one of ordinary skill in the art at the time of the invention.

Additionally, when the motor vehicle was off for a given period of time, the coolant temperature would approach ambient, falling well outside the set control parameters from while the vehicle was running; also, ambient temperature will change the rate of heat transfer from the radiator to the air. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the information from the ambient temperature sensor as the initial set point for the coolant temperature in the algorithm of Goubeaux when the vehicle is turned on after a minimum period of time in order to prevent overcorrection and waste, and additionally to continue to use the input of ambient temperature in all phases of the closed-loop control system.

Response to Arguments

8. Applicant's arguments filed 4/10/2009 have been fully considered but they are not persuasive.

9. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves *or in the knowledge generally available to one of ordinary skill in the art.* See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, both Corriveau and Goubeaux et al control temperature, and Goubeaux et al explicitly discloses the method used to be implemented to minimize overshoots of the parameter controlled (see abstract of

Goubeaux et al). As avoiding overshoot of temperature is old and well known in the art to be a positive thing when controlling temperature, this is considered to be adequate motivation to combine the method of Goubeaux et al with the system of Corriveau.

The applicant further argues on page 6 that Corriveau does not disclose changing the device set point in order to control the engine temperature. However, as Corriveau explicitly discloses that "the *target engine temperature* and the desired mass flow rate through the engine can be an *indirect function of engine load and a direct function of heat released*" (see column 6 lines 52-54, emphasis added), this argument is clearly unpersuasive.

The applicant argues on page 7 that Goubeaux discloses compressor and pressure control but not temperature control, and that this "discloses nothing about temperatures," "draws no conclusions regarding the mass flow itself," and "temperature is influenced by volume and volume changes."

Pressure is defined as force per unit area.

Temperature is defined as "the measure of heat in a substance" or, more importantly, "a measure of the internal energy that a substance contains."

There is an equation commonly known as the Noble or Ideal Gas Law. It is frequently used to explain the relationship between pressure and temperature.

PV=nRT

P=pressure

V=volume

n=number of molecules (or moles) present within the volume

R=a constant. This varies according to what units the equation is in.

T=temperature, absolute (Rankin or Kelvin)

As can clearly be seen from the equation above, pressure and temperature are directly related. If pressure goes up, so does temperature. If volume goes down, pressure and temperature both go up. Additional mass also affects both pressure and temperature, as does additional mass flow. An increased flow rate will result in a lowered pressure. It will also result in a more rapid heat exchange between elements, because it maintains the temperature difference by permitting less opportunity for the elements to go into equilibrium.

As controlling temperature inherently also controls pressure, and vice versa, this argument that a pressure algorithm is not appropriate to apply to temperature, is unpersuasive.

Regarding the applicant's argument on page 8 that there are not three distinct levels of temperature control based on load as claimed, it is obvious for the look-up tables for target engine temperature as a function of eight distinct variables (engine load, control valve structure index, control valve structure position, initial water pump rpm, water pump PWM setting, target radiator temperature, target engine oil temperature; see column 3 lines 44-51) to have at least three distinct levels of temperature control; therefore, this argument is unpersuasive.

Regarding the applicant's argument on page 8 concerning the rejection of claims 4, 5, and 7, as the use of ambient temperature data in the manner recited in the claims is the only limitation not met above in the rejections of claims 1-3, 6,

and 8, the addition of only this element from the Dao patent is considered to be sufficiently comprehensive to maintain this rejection, rendering this argument unpersuasive.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXIS K. COX whose telephone number is (571)270-5530. The examiner can normally be reached on Monday through Thursday 8:00a.m. to 5:30p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules can be reached on 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AKC/

/Frantz F. Jules/

Supervisory Patent Examiner, Art Unit 3744